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ABSTRACT

This report is the fourth in a series of reports which the PLATO Services Organization publishes to keep users up to date on curricular developments on the PLATO system. Materials are listed here under 71 subject areas. The report first presents all subject areas in which PLATO lesson development is in progress; it then provides a summary of completed topics available for student use, arranged by subject area together with the number of instructional hours and the names of persons to contact for further information. (SC)

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PLATO CURRICULAR MATERIALS

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by

Elisabeth R. Lyman

COMPUTER-BASED EDUCATION RESEARCH LABORATORY

UNIVERSITY OF ILLINOIS, URBANA, ILLINOIS

JULY 1976

No. 4

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PLATO CURRICULAR MATERIALS

SECTION I

Introduction

PLATO curricular materials have increased steadily in numbers available to users during the first six months of 1976. In addition, there has been a noticeable trend in revision of many of the older lessons. Two prinicpal motivating factors were the cause of such revisions: the data gathered from considerable student use of the lessons and the opportunity to publish lessons for use on other PLATO systems. The number of terminals on the network has reached its present capacity of around 950 located at 146 sites, one in Stockholm, Sweden, and the rest in the United States. Twenty-six of the sites are on the University of Illinois campus in Urbana. There are also two other PLATO systems, one in Tallahassee, Florida, and one in Minneapolis, Minnesota. PLATO curricular materials now include about 4500 well-tested lessons representing about 4000 hours of instructional material in seventy-one subject areas.

This report is the fourth in a series of reports which the PLATO Services Organization at the Computer-based Education Research Laboratory of the University of Illinois publishes to keep PLATO users and prospective users up to date on curricular developments on the University of Illinois PLATO system. The report supercedes CERL Report X-41, No. 3, published in December 1975. The X-41 Reports provide information on lessons which have been completed, have been adequately checked, and have been used by students.

CERL Report X-41, No. 4 contains a list of (a) all the subject areas and instructional levels in which lesson development is in progress and (b) the completed topics arranged by subject area together with the number of instructional hours available in each topic whenever possible, and the names of persons to contact for more detailed information on the listed materials.

SECTION II

A. Subject Areas

Lesson development is in progress in the following curricular areas: (numbers indicate teaching levels; * indicate areas having tested completed materials).**

*Accountancy 3,4
Agriculture
Agricultural Economics 4
* Agronomy 4
Animal Science 4
* Dairy Science 4
Architecture 4,5
Biomechanics 4
*Broadcast Media
*Business Administration 4,5
*Cinema Studies 4
*Classics 4
*Communications 4
Computer Graphics 2,4
*Computer Science 4
Counseling 4
Design Science 4
*Driver Certification 6
Education
Art Education 2,4
Business Education 2,3,4
Computer-Assisted Instruction 4
* Computer-Managed Instruction 4
* Education--General 3,4
Educational Administration 4
Educational Psychology 4,5
Engineering
* Aeronautical and Astronautical 4
Agricultural Engineering 4
Bioengineering 4
Chemical 4
Construction Engineering 4
* Electrical/Information 4
Energy Engineering 4
* Graphics 3,4
Industrial 4
Materials 4
Mechanical 4
Nuclear 4
Theoretical and Applied Mechanics 4
*English 2,4

Foreign Languages
Akkadian 2,4
Arabic 2,4
* Chinese 4
* Danish 2,4
* English as a Second Language 2,4
Esperanto 2,4
* French 2,4
* German 2,4
* Hebrew (Modern) 2,4
Hindi 2,4
* Italian 2,4
* Japanese 2,4
Korean 2,4
* Latin 2,4
Lithuanian 4
Navajo 4
Norwegian 2,4
Persian 2,4
Polish 2,4
* Russian 2,4
Sanskrit 2,4
Serbian 2,4
* Spanish 2,4
* Swahili 2,4
Swedish 2,4
Thai 2,4
Turkish 2,4
Yoruban 2,4
Home Economics 3,4
Humanities 4
Industrial and Labor Relations 4
Information Science 4
International Relations 2,4
*Journalism 4
*Law 5
*Library Science 5
*Linguistics 4
*Literature 4
*Mathematics 1,2,3,4

****

** 1 - Elementary 2 - Secondary 3 - Vocational 4 - College
5 - Professional 6 - General

Medical and Health Sciences
* Dentistry 5
Medical Information Systems 3,5
* Medicine 5
* Nursing 3,5
* Pathology 5
Pharmacology 5
* Pharmacy and Pharmacal Science 5
* Radiology 5
* Veterinary Medicine 4,5
Military Leadership Training 4,5
*Music 1,2,4
Natural Sciences
* Biochemistry 4,5
* Biology 2,4
* Biophysics 4,5
* Botany 4
* Environmental Studies 2,4
Forestry 4
* Genetics 4,5
* Microbiology 4,5
* Physiology 4,5
Zoology 4
*Nutrition 4
Optometry 5
*Photography 2,3,4
*Physical Education 2,4
Physical Sciences
* Acoustics 4
* Astronomy 2,4
Astrophysics 4
* Chemistry 4,5
* Electron Microscopy 4
* Geology 2,4
Meteorology 4
* Physics 4,5
*Population Dynamics 2,4,5
*Reading 1
Recreation and Park Administration 4
Rocketry 2
Social Sciences
Anthropology 4
* Economics 4
* Finance 4
* Geography 2,4
History 4
Philosophy 4
* Political Science 2,4
* Psychology 4,5
* Social Welfare 4
* Sociology 4
*Speech and Hearing Sciences 3,4
*Statistics 3,4,5
Telegraphy 2,3
Theater 4
Traffic and Transportation 2,3,4
*Urban Studies 4
Video and Film 4
Vocational Training
Business Education 2,3,4
* Business Skills 2,3,4
* Electronic Training 3,4
* Food Service Training 3
* Leadership Training 3,4
* Machinist Training 3,4
* Micro Precision 3,4
* Pilot Training 3,4
* Retail Training 3,4
* Vehicular Training 3,4

****

** 1 - Elementary 2 - Secondary 3 - Vocational 4 - College
5 - Professional 6 - General

SECTION II

B. Summary of Materials Available for Student Use

ACCOUNTANCY

Financial Accounting Principles
- Accrual Concepts (40 min)
- Changes in the Balance Sheet Equation (55 min)
- *Journal Entries I (75 or 50 min)
- *Journal Entries II (50 or 75 min)
- *Classification and Normal Balances (30 min)
- Income Statement (45 min)
- Closing Entries (50 min)
- General Journal, Ledger (variable)
- Adjusting Entries I (75 or 65 min)
- Adjusting Entries II (65 or 75 min)
- Worksheets (50 min)
- Inventory (Perpetual and Inventory Errors) (40 min)
- Accounts Receivable (55 min)
- Terms of Sale (40 min)
- Special Journals (20 min)
- Inventory Methods (35 min)
- Temporary Investments (90 min)
- Bank Reconciliations (50 min)
- Notes and Interest (70 min)
- Fixed Assets I: Acquisition and Depreciation (70 min)
- Fixed Assets II: Depletion, Amortization and Disposal (45 min)
- Compound Interest (70 min)
- *Long-term Investments in Bonds (Effective Rate Amortization) (55 min)
- Entries for Stockholders' Equity (75 min)
- *Long-term Liabilities (Effective Rate Amortization) (90 min)
- Investments (Cost vs Equity) (45 min)
- Funds Flow (45 min)
- Fund Statements (70 min)

Managerial Accounting Principles (30 hrs)
- Introduction to Cost Accounting (35 min)
- Cost Classification II
- Process Costing
- Job-Order Costing
- Non-Manufacturing Costs
- Breakeven Analysis
- Incremental Analysis

*Alternative versions of these lessons:
- Journal Entries for Service Firms
- Classification
- Long-Term Liabilities -- Bonds (Straight-Line Amortization)

ACCOUNTANCY -continued-

Managerial Accounting Principles -continued-
- Compound Interest
- Capital Budgeting
- Planning and Control
- Operational Budgeting
- Cash Budgeting
- Standard Costing I and II

(Contact: J. C. McKeown, 285 Commerce West, UIUC, Urbana, Illinois 61801, 217/333-4538 {mckeown of com})

AERONAUTICAL and ASTRONAUTICAL ENGINEERING

Aircraft Design (12 hrs)

(Contact: H. S. Stillwell, 101 Transportation Building, UIUC, Urbana, Illinois 61801, 217/333-2650 {glass of aero})

General
- Aerospace Engineering Games (.25+ hrs)

Solid Mechanics
- Elementary Beam Theory
  - Design (3 hrs)
  - Displacements (1 hr)
  - Internal Forces (3 hrs)
  - Section Properties (1.5 hrs)
  - Sheer Stress (2 hrs)
  - Theory (2 hrs)
- Elementary Torsion Theory
  - Design (1 hr)
  - Displacements (.5 hrs)
  - Internal Forces (3.5 hrs)
  - Section Properties (1.5 hrs)

(Contact: James A. Bennett, General Motors Corp., Research Laboratories, Warren, Michigan 48093 (work done at UIUC) {glass of aero})

AGRONOMY

Soil Physics
- Soil Water (open-ended, 2 to 15 hrs)

(Contact: Charles Boast, S-216 Turner Hall, UIUC, Urbana, Illinois 61801, 217/333-4370 {boast of cerl})

ASTRONOMY

Kepler's Laws of Planetary Motion (open-ended, 2-3 hrs)
Moon Phases and Almanac (open-ended, 2-3 hrs)
Stellar Constellations (open-ended, 2-3 hrs)

(Contact: Elaine Avner, 364 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-6500 {e avner of pso})

BIOCHEMISTRY

Basics of pH and Acid/Base
- Introduction and the Henderson-Hasselbach Equation
- Acid-Base Character of Amino Acids, Peptides, Proteins
- Buffer Problems
- Basic Science Applications in Clinical Medicine

Energetics
- Basic Thermodynamics Quiz

Enzyme Kinetics
- Quantitative Description and the Michaelis-Menton Relationships
- Interactive Graphics
- Allosteric Control

Proteins
- Amino Acids: Structures and Biochemical Characteristics
- Natural Amino Acids: Structures, Names and Abbreviations
- Amino Acids, Part II: Peptide Sequence Analysis
- Introduction to Serum Enzymes

Nucleic Acids
- Identification of Nucleic Acids -- Competitive Interaction

Carbohydrates
- Introduction to Monosaccharides
- Structure of Monosaccharides
- Carbohydrate Identification and Structure
- Carbohydrate Identification -- Competitive Interaction

Lipids
- Identification of Lipid and Lipid-like Compounds -- Competitive Interaction

Cofactors, Etc.
- Vitamins I: Comprehensive Quiz
- Vitamins II: The Water Scluble Vitamins: B_1, B_2, B_6, and B_{12}
- Vitamins III: The Water Soluble Vitamins: Niacin, Pantothenic Acid, Folic Acid, C, and Biotin

BIOCHEMISTRY -continued-

Intermediate Metabolism
Carbohydrate Metabolism: Glycolysis
Intermediate Metabolism II: The TCA Cycle

(Contact: Dr. Allen Levy, School of Basic Medical Sciences, UIUC, Urbana, Illinois 61801, 217/333-2507 {levy of mcl})

Protein Synthesis

(Contact: Prof. E. Kuemmerle, Chemistry Department, Illinois State University, Normal, Illinois 61761, 309/438-2359)

BIOLOGY

Experimental Tools and Techniques (see also BOTANY, MICROBIOLOGY)
Tools Used in Biology -- Log Scales, Metric System, Chi-Square Analysis (60 min)

Chemical Basis of Life
Matter and Atoms (50 min) {richcrockett of kka}
Bonding and Organic Chemistry (35 min) {roncrockett of kka}
Periodic Table of the Elements (30 min) {arsenty of lsci}
Scaler Experiment and Carbon-14 Dating Experiment (45 min) {arsenty of lsci}
Chemistry for Biology Students (40 min)

Cellular Structure and Function (see also BOTANY, MICROBIOLOGY)
Ultrastructural Concept (45 min)
Cells Structure and Function (45 min)
Diffusion and Osmosis (35 min)
Surface Area/Volume in Living Systems (15-25 min)

Reproduction and Development (see also BOTANY)
Mitosis (35 min)
Mitotic Cell Division (30-40 min)
Meiosis (45 min)
Embryology (45 min)

Molecular Genetics
DNA and Protein Synthesis (40 min)
DNA, RNA, and Protein Synthesis (15-30 min)

Bioenergetics: Enzymes and Metabolism (see also BOTANY)
Enzyme Experiments (30 min)
Essentials of Photosynthesis (15-20 min)
ATP, Anaerobic and Aerobic Respiration (30 min)
Electron Transport Chain (15-20 min)
Measuring the Level of Life (30 min)

Classical Genetics (see GENETICS)

BIOLOGY -continued-

Evolution (see also BOTANY, GENETICS)
- Natural Selection (50 min)
- Natural Selection Experiment (30-40 min)
- Comparative Serology (30-45 min)
- Genetic Drift (30-40 min) {hyatt of uiccbio}

Population Biology and Ecology (see also BOTANY, MICROBIOLOGY)
- Biogeochemical Cycles (20-30 min)
- Energy Relationships in Biological Systems (60-75 min)
- Predator-Prey Relationships (60 min)
- Buffalo -- Animal Population Experiment (25-45 min)
- Population Dynamics (15-30 min)

Plant Anatomy and Morphology (see BOTANY)

Plant Pathology (see BOTANY)

Plant Growth and Development (see BOTANY)

Taxonomy (see also BOTANY)
- Use of Taxonomic Keys (20 min)

Human Anatomy and Physiology
- ADH and Water Balance in Humans (30-40 min)
- Neuron Structure and Function (30-45 min)
- Hormonal Control of the Menstrual Cycle (60 min)
- Human Digestive System (50 min)
- The Heart -- Structure and Function (40 min)
- Cardiac Cycle (50 min)
- Heart Rate Regulatory Mechanisms (45 min)
- The Mechanics of Breathing (50 min)
- Elementary Psycho-Physiology of Audition (90-120 min)
- Movement (Muscles) (60 min) {denault of biocc}

Animal Behavior
- Physiological Basis of Learning (30 min)
- Simple Animal Behavior -- Klinokinesis (30-45 min)
- Social Behavior of Birds (30-45 min)
- Classical Imprinting in Fowl (35-45 min) {hyatt of uiccbio}

(General Contact: Kathie Herrick, 203B Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-7450 {herrick of biocc})

BIOPHYSICS

Bioelectric Phenomena in Excitable Cells (3-6 hrs)
- Electricity in Physiology
- Neuron Excitability Experiment
- Electrodiffusion

(Contact: Lloyd Barr, 446 Burrill Hall, UIUC, Urbana, Illinois 61801, 217/333-7423 {mckown of physio})

Modelling (open-ended)
- Hodgkin-Huxley Model of a Nerve Cell Membrane (2 hrs)
- Generalized Biophysical Modelling Program

(Contact: David Walter or Russ McKown, 42 Burrill Hall, UIUC, Urbana, Illinois 61801, 217/333-4687 {mckown of physio})

BOTANY

Tools and Techniques
- A Tool: The Spectrophotometer (25 min)
- Experimental Technique (45 min)
- Life in a Microcosm (20+ min)

Taxonomy
- Plant Taxonomy (45 min)
- Tree Identification (15 min)

Anatomy and Morphology
- Organization of the Higher Plant (45 min)

Populations
- Populations Laboratory Using E. Coli (15-25 min)

Genetics (see GENETICS)

Evolution
- Induced Mutations Experiment Using Aspergillus (20-40 min)
- Plant Life Cycles (90 min)

Growth and Development
- Seed Germination (30-40 min)
- Plant Growth (20-30 min)
- Plant Responses and Apical Dominance (30-40 min)
- Flowering and Photoperiod (30-45 min)
- Fruiting and Leaf Senescence (15-20 min)
- Enzyme-Hormone Interactions (20-40 min)

Plant Pathology
- Plant Pathology (40 min)

BOTANY -continued-

Bioenergetics
Photosynthesis (40 min)
Experiments in Photosynthesis (20 min)
Respiration and Enzymes (45 min)
Experiments in Respiration (30 min)

Cell Function
Introduction to Water Relations (15 min)
Water Relations Laboratory (30 min)

(Contact: Alan Haney, 401 Natural History Building, UIUC, Urbana, Illinois 61801, 217/333-4396 {haney of bot100})

BUSINESS ADMINISTRATION

Management Science (12.5 hrs)
Inventory Theory
Introductory Game Theory
Linear Decision Models
Rational Decision Making

(Contact: Richard V. Evans, 383 Commerce West, UIUC, Urbana, Illinois 61801, 217/333-6511)

BUSINESS SKILLS

Business Skills Training Course (Lowry Air Force Base)
Inventory Management for Supply Specialists (2 hrs)

(Contact: Larry D. Francis, MTC Project, 361 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-7465 {larry francis of mtc})

Typing
Beginning typing (9 15 min. sessions)

(Contact: A. Appel, 206 Pell Circle, Urbana, Illinois 61801, 217/344-4131 {a appel of mcl})

CHEMISTRY

Analytical Chemistry
Calculation of K_{sp} from Potentiometric Data (60-90 min)
Effects of pK_a (acid) and (base) on Shape of Titration Curves (60 min)
Introduction to Beer's Law (45 min)
Ion Selective Electrodes (45 min)
Basic Gas Chromatography (60 min)

(Contact: Ed Nagel, Neils Science Center, Valparaiso University, Valparaiso, Indiana, 46383, 219/462-5111 {nagel of vu})

Introduction to Mass Spectroscopy
Nodes and Shapes of Atomic Orbitals

(Contact: Harrison Shull, Chemistry Department, Indiana University, Bloomington, Indiana 47401, 812/337-8913 {shull of iu})

General Chemistry
The Gas Laws (40 min)
Writing Formulas for Ionic Compounds (25 min)

(Contact: Milada Benca, Kennedy King College, 6800 S. Wentworth, Chicago, Illinois 60622, 321/962-3421 {benca of kka})

Identification of Some Inorganic Ions

(Contact: Gardiner Myers, Department of Chemistry, University of Arizona, Tucson, Arizona 85721, 602/822-4218 {kent of arizona})

Interpretation of Mass Spectra
Chromatography

(Contact: Steven Murov, Cox House, Sangamon State University, Springfield, Illinois 62708, 217/786-6549 {murov of ssu})

Behavior of Gases (30 min)
Review of Mathematical Skills
Use of the Slide Rule
Calculator and Graphing
Kinetics
Practice Balancing Simple Chemical Equations
Chemical Formulas Practice
Inorganic Qualitative Analysis Simulation
Ionic Nomenclature
Simple Covalent Nomenclature
Quiz on Stoichiometry
Octahedral Ligand Effect
Mass Spectra Illustration
Nuclear Chemistry

(Contact: Robert Grandey, Cleveland Learning Center, 7835 Freeway Circle, Middleburg Heights, Ohio 44130, 216/243-9292)

CHEMISTRY -continued-

General Chemistry -continued-

Review of Basic Tools
- The Metric System (60 min)
- Scientific Notation (50 min)

Elements and Atoms
- Names of the Elements (20 min)
- Names of the Elements (Interterminal Game)
- Description of Some Elements (30 min)
- Atomic Number and Atomic Mass (30 min)
- Valence Electrons (20 min)
- Electronic Configurations (60 min)
- Historical Introduction to Atomic Theory (40 min)

Chemical Bonding, Compounds
- Ionic Bonding (25 min)
- Lewis Structure and Chemical Bonding (65 min)
- Molecular Formulas and Percent Composition (60 min)
- Calculation of Molecular Weights

Nomenclature
- Inorganic Nomenclature (ions, acids, bases, salts) (50 min)

Solutions
- Solutions: Concentration (60 min)
- Freezing Point Depression Experiment (50 min)

Balancing Equations, Stoichiometry
- Chemical Stoichiometry (60 min)
- Balancing Equations (30 min)
- Balancing Oxidation-Reduction Equations (30 min)

Acid-Base Chemistry
- Reactions of Acids and Bases (25 min)
- Introduction to Titrations (2 versions, 35 min each)
- Acid-Base Titration Experiment (20 min)
- pH and Acid-Base Titration Curves (40 min)

Chemical Equilibrium
- Introduction to Chemical Equilibrium (30 min)
- Chemical Equilibrium Problems
- Chemical Equilibrium Problems II (K_a, K_b, pH)

Chemical Thermodynamics
- Heats of Reactions (Hess's Law) (50 min)

Laboratory Techniques
- Use of the Analytical Balance (uses microfiche)

(Contact: Ruth Chabay, 250 Roger Adams Laboratory, or Stanley Smith, 254 Roger Adams Laboratory, Box 46, UIUC, Urbana, Illinois 61801, 217/333-3839 {chabay of chem or stan smith of chem})

Organic Chemistry

Nomenclature and Structure
- Organic Nomenclature (2 parts) (60 min)
- Names of Organic Functional Groups (40 min)
- Conformation of Alkanes (25 min)
- Conformation of Cycloalkanes (40 min)
- Bonding in Carbon Compounds (30 min)
- Optical Activity in Organic Molecules (40 min)

CHEMISTRY -continued-

Organic Chemistry -continued-

Functional Group Chemistry

Free Radical Hologenation (60 min)
Alkene Chemistry (40 min)
Alkene Problems (touch) (30 min)
Alcohol Chemistry (70 min)
Alcohol Problems (touch) (25 min)
Substitution and Elimination Reactions (40 min)
Substitution Problems (touch) (30 min)
Additions to Carbonyl Groups (40 min)
Arene Chemistry (50 min)
Carboxylic Acids (40 min)
Esters of Carboxylic Acids (35 min)
Carboxylic Acids (Part 3) (50 min)

Multistep Synthesis

Synthesis of Aromatic Compounds (40 min)
Aliphatic Synthesis Games (mono and interterminal) (1 hr)
Aromatic Synthesis Game (interterminal)

Carbohydrates and Amino Acids

Carbohydrates (Parts 1, 2, 3) (20, 40, 60 min)
Glucose Mutarotation Experiment (30 min)
Names and Structures of Common Amino Acids (40 min)

Spectroscopy

Introduction to Nuclear Magnetic Resonance (25 min)
NMR Spin-Spin Coupling (30 min)
Infrared Spectroscopy (with microfiche) (60 min)

Qualitative Organic Analysis

Calculation of Empirical Formulas
Some Reactions Used in Qualitative Analysis (50 min)
Qualitative Organic Analysis (90 min)
Identification of Organic Unknowns (20 min)

Organic Laboratory

Melting Points and Mixed Melting Points (15 min)
Fractional Distillation Experiment (15 min)

Advanced Topics

Mechanism of Semicarbazone Formation (60 min)

(Contact: Stanley Smith, 254 Roger Adams Laboratory, Box 46, UIUC, Urbana, Illinois 61801, 217/333-3839 {stan smith of chem})

CHINESE

Elementary Chinese (15 hrs)

(Contact: Chin-Chuan Cheng, 4101 Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333-1206 {cheng of mfl})

CINEMA STUDIES

Experimenting with Film Studies (4 hrs)
- Bibliographies on Films and Directors
- Cinema Chronology
- Cinema Hardware
- Cinema Quiz
- Multiple Choice Questions with Mini-Essay Answers
- Selected Student Papers

(Contact: Fernand Marty, G70c Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333-9776 {marty of mfl})

COMMUNICATIONS

Broadcast Media
- Broadcast Management Simulation (4.5 hrs)

(Contact: Timothy Fay, Control Data CBEducation Center, 901 S. Highland St. Arlington, Virginia 22204, 703/979-3483)

COMPUTER MANAGED INSTRUCTION

(The following lessons are not available for public use at this time, but the "contact" is glad to talk to anyone about them.)

Management of Study and Learning for Course in Elementary Economics (10 hrs)
Management of Study and Learning for Course in American History (5 hrs)

(Contact: Thomas Anderson, 226 Education, UIUC, Urbana, Illinois 61801, 217/333-2604 {alessi of edpsych})

COMPUTER SCIENCE

General and Miscellaneous Programs
- Entry into the ACSES System
- Conversational Request Translator and Processor
- Master Index to the Computer Science Lessons
- Introduction to Computers and Computer Programming
- Introduction to Algorithms
- Turing Machines
- Simulation of Epic 2000 Calculator
- Maze Traversing Algorithm
- Manual for Grafix
- PLATO Hardware and Software

Mini-Languages
- Introduction
- Child's Drawing
- Drawing Language
- Recursion
- Introduction to Robot
- Robot Mini-Language
- Stacks Mini-Language
- Backtrack Algorithm

Language Independent Programming
- Introduction
- Flow Charting
- DO-Type Loops
- Begin Blocks
- Decision Tables
- File Processing
- Recursion
- Structured Programs
- Formal Computer Languages

PL/I Language (25 hrs)
- Introduction
- Data Types
- Operations
- Arithmetic
- String Operations
- IF-THEN, DO Groups
- DO Loops
- Arrays
- Advanced Array Examples
- Procedures
- LIST Input/Output
- EDIT Input/Output
- Drill on EDIT I/O
- Recursive Programming
- Data Structures
- Exam

COMPUTER SCIENCE -continued-

FORTRAN Language (10-20 hrs)
- Introduction
- Arithmetic
- IF Statements
- DO Statements
- Subprograms
- Subprogram Examples
- Introduction to Arrays
- Advanced Arrays
- FORMAT Statements
- Character Handling
- Format Simulator
- Exam

BASIC Language
- Introduction
- Beginning BASIC
- Advanced BASIC
- Arrays in BASIC
- Exam

COBOL Language
- Introduction to the COBOL Lesson Sequence
- COBOL Identification and Environment Divisions
- Advanced COBOL PICTURE Clauses
- COBOL Data Division
- COBOL Procedure Division

APL Language
- Introduction to the APL Language
- Scalars
- Vectors

Machine and Assembler Languages and Computer Simulators
- A Simple Computer
- Machine Language
- PDP8/L Simulator

Other Languages
- SNOBOL4
- LISP
- Introduction to LOGO
- LOGO Test Instruction
- LOGO Procedures

COMPUTER SCIENCE -continued-

Information Processing
- Sorting
- Sort Program Judging
- Binary Searching
- Introduction to the Data Structures Sequence
- Information Structures
- Information Structures Drills
- Experience with Stacks
- Experience with List Space
- Experience with List Nodes Drills

Numerical Analysis
- Introduction
- Matrix Multiplication
- Numerical Integration
- Linear Equations
- Nonlinear Equations
- Least Squares
- Linear Programming
- Monte Carlo
- Spline Approximations

Applications
- Discrete Simulation
- Simulation Games
- Traffic Simulation
- Payroll Program
- Business Applications

Logical Design
- Introduction
- Boolean Expressions
- Basic Building Blocks
- Complementary Building Blocks
- Combined Problems
- Data Flow Diagrams

Compilers
- Reference Manual
- PL/I Compiler
- FORTRAN Compiler
- BASIC Compiler
- COBOL Compiler
- APL Compiler
- SNOBOL4 and SPITBOL Compiler

COMPUTER SCIENCE -continued-

Communication
- Comments Between C.S. Students and Authors
- On-Line Consultation with an Instructor
- Bulletin Board for Course Messages
- C.S. Author-Author Communication

Lesson Writing and Evaluation
- User Feedback
- On-Line Consultation
- Author Introduction
- Lesson Writing
- KAIL Compiler
- KAIL Reference
- Common Code, etc.
- Author Communication
- Student Router
- Author Practice

Computing Services Office
- IBM OS/360/370 Job Control Language
- IBM 360 Load Modules and Dec-10 SAV Files
- CalComp Plotter
- Remote Terminals

(Contact: George Friedman, Jr., 128 Digital Comp. Lab., UIUC, Urbana, Illinois 61801, 217/333-7505 {friedman of csa})

Data Structures (1 hr)

(Contact: Stuart C. Shapiro, Computer Science Department, 101 Lindley Hall, Indiana University, Bloomington, Indiana 47401, 812/337-1233 {shapiro of iu})

PLATO TUTOR Language Training Lessons (up to 40 hrs)
- Computer Background for New PLATO Authors (2 hrs)
- TUTOR, an Interactive Reference for New Authors (24 hrs)
- Editing Principles and Exercises (7 hrs)
- Tests on Basic TUTOR Commands (2 hrs)
- Author Mode and Student Mode Solutions to the Basic TUTOR Programming Problems
- States in TUTOR, the Order of Execution of TUTOR Commands
- Variables, for Those Who Hate Them (1 hr)

(Contact: Larry D. Francis, 361 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-7465 {larry francis of mtc})

DANISH

Syntax (2 hrs)

(Contact: Fernand Marty, G70c Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333-9776 {marty of mfl})

DENTISTRY

Biostatistics
Dental Histology
Structure of the Tooth

(Contact: Robert Votaw, Bldg, A, Rm. M033, Health Center, University of Connecticut, Farmington, Connecticut 06032, 203/674-2137 {votaw of conn} or {kavanagh of conn})

Diagnosis and Treatment of Emergencies (self-evaluation and post-test) (1.5 hrs)
Liquid Solutions
Medical Emergencies (2 hrs)
- Cardiopulmonary Resuscitation
- Routes of Drug Administration
- Treatment of Medical "Life-Threatening" Emergencies for the Dentist

Mock National Boards (100 questions from the 1974 Standard Achievement Test in Biological Sciences)
Neuroscience Self-Assessment Lessons
Prescription Writing (2 hrs)
Simulation Exercises
Statistics for Dentistry (1.5 hrs)

(Contact: Steve Summers, J. Hillis Miller Health Center, Comicore Building, Rm. C-237, University of Florida, Gainesville, Florida 32601, 904/392-4119)

DRIVER CERTIFICATION

Mastery Learning Materials for Driver Training (5 hrs)

(Contact: Lisa Parker Brenner, School of Basic Medical Sciences, UIUC, Urbana, Illinois 61801, 217/333-2107 {brenner of med})

ECONOMICS

General Equilibrium Theory in an Exchange Economy (1.5 hrs)
- Consumer Behavior
- Multiple Market Equilibrium Simulation

(Contact: Robert Gillespie, 450 Commerce West, UIUC, Urbana, Illinois 61801, 217/333-4586)

ECONOMICS -continued-

Introductory Economics Concepts
Macroeconomics (2 hrs)
Microeconomics (1.5 hrs)

(Contact: Donald Paden, 225 David Kinley Hall, UIUC, Urbana, Illinois 61801, 217/333-2175 {barr of economic})

See also COMPUTER MANAGED INSTRUCTION

EDUCATION

Mathematics
Secondary and Continuing Education
Classroom Simulations Focusing upon Teaching and Questioning Strategies (5 hrs)

(Contact: Janice Flake, Mathematics Education Department, Florida State University, Tallahassee, Florida 32306, 904/644-1833 (lessons developed at UIUC))

Physical Education
Physical Education Curriculum Planning--A Simulation (2 hrs)

(Contact: Karen Fry, 201 Kinney Gymnasium, UIUC, Urbana, Illinois 61801, 217/333-2484 {fry of pecp})

Psychology
Effective Feedback Skills for Company Commanders (6 hrs)

(Contact: Larry D. Francis, MTC Project, 361 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-7465 {larry francis of mtc})

Reading Disabilities
A Computer Simulation of Students with Reading Disabilities

(Contact: Vicki Boysen, 227 Computer Science, Iowa State University, Ames, Iowa 50010, 515/294-8338 {boysen of amesrad})

Science
Teaching for Mastery in Science (2 hrs)

(Contact: James R. Okey, College of Education, University of Georgia, Athens, Georgia 30602, 404/542-1764)

Teaching
Simulation of First Year of Teaching (1 hr)

(Contact: Owen F. Gaede, 382 Education Building, UIUC, Urbana, Illinois 61801, 217/333-3643 {gaede of ed})

EDUCATION -continued-

Test Construction (Aberdeen Proving Grounds) (12 hrs)
Supervision of Practice Exercise
Characteristics of Testing
Purposes of Testing
Types of Tests
Test Administration
Test Analysis I and II
Test Analyzer and Math Drills
Test Item Analysis

(Contact: Larry D. Francis, MTC Project, 361 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-7465 {larry francis of mtc})

ELECTRICAL/INFORMATION ENGINEERING

Computer-Guided Experimentation
Description of Computer-Guided Experimentation Research
Computer-Guided Experimentation Research Routines
Computer-Guided Experimentation Lessons (4-12 hrs)
(Completion time dependent on prior laboratory experience)
Introduction to Computer-Guided Experimentation (15 min)
The Oscilloscope (2 hrs)
The Audio Oscillator (1 hr)
The Function Generator (1 hr)
The DC Supply (.5 hr)
The Vacuum Tube Voltmeter (1 hr)
Transients (1.5 hr)
Impedance (1.5 hr)
Two-Port Networks (1.5 hr)

(Contact: James P. Neal, 361 Electrical Engineering Building, UIUC, Urbana, Illinois 61801, 217/333-4351 {neal of eecge})

Basic Electronics
Diode Electronics (.75 hr)
Transistor Bias (1.5 hr)
Transistor Amplifiers (1.5-2 hrs)

(Contact: R. Arzbaecher, Information Engineering Department, UICC, Chicago, Illinois 60680, 312/996-2311 {droege of uicc})

Circuits
Basic Principles of Network Analysis
Drill on DC Analysis Topics
Conventional Current (5 min)
Ohm's Law and the Resistor (26 min)
Voltage and Current Sources (9 min)
Series/Parallel Nets (22 min)
Voltage Division (10 min)

ELECTRICAL/INFORMATION ENGINEERING -continued-

Drill on AC Analysis Topics
- Sinusoidal Functions (10 min)
- Complex Number Arithmetic (15 min. drill, calculator, plotter)

Network Simulators (open-ended, non-tutorial)
- DC and Steady-State AC
- Step-Function and Source-Free RL and RC
- Source-Free Parallel RC

(Contact: Paul Weston, 329d Electrical Engineering Building, UIUC, Urbana, Illinois 61801, 217/333-4694 {weston of ee})

Electromagnetics
- Introductory Electromagnetics (Statics)
  - Concepts of Dielectrics in Media and Polarization
  - Divergence (.5 hr)
  - Physical Significance and Electrical Applications of the Curl (.5 hr)
  - Potential Maps (open-ended)
  - Rectangular, Cylindrical and Spherical Coordinate Systems (2 hrs)
- Antennas and Wave Propagation
  - Electromagnetics: Smith Charts, Antennae Field Pattersn, Array Patterns (open-ended)

Circuits
- Semiconductor Electronics
  - pn Junction Theory
  - Measurement of Resistivity in Semi-Conducting Materials
  - Diode Design (open-ended)
  - Graphical Notes on Mosfets
- Theory and Fabrication of Semi-Conductor Devices
  - Diffusion Profile Plotter (open-ended)
  - Integrated Circuit Mask Generator

Systems
- Control Systems -- Plotting Routines
  - Logical Expression Minima (open-ended)

(Contact: David V. Meller, Rm. 257 Engineering Research Laboratory, UIUC Urbana, Illinois 61801, 217/333-6500 {dvm of ee} or Edward Mast, 3718 Electrical Engineering Building, UIUC, Urbana, Illinois 61801, 217/333-4946 {ed mast of ee})

ELECTRONIC TECHNOLOGY

Electronic Training (7 hrs) (Army Signal Center, Ft. Monmouth)
- Parallel Circuits
- Series Parallel Circuits
- Ohm's Law
- DC Power
- Series Circuits
- Trouble Shooting
- Introduction to First Aid and Safety in the Shop

Electronic Training (San Diego)
- Using the Simpson 601-1 Multimeter as an Ohmeter (4 hrs)
- Using the Simpson 601-1 Multimeter as an Ammeter (4 hrs)
- Oscilloscope Training (4 hrs)

(Contact: Larry D. Francis, MTC Project, 361 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-7465 {larry francis of mtc})

ELECTRON MICROSCOPY

The Hitachi HU-11 Series Vacuum System (.3-1 hr)

(Contact: D. L. Davis, Center for Electron Microscopy, UIUC, Urbana, Illinois 61801, 217/333-2108 {davis of uicem})

ENGINEERING GRAPHICS

Multiview Projection (3 hrs)
Crossword Puzzle on Drafting Terminology (1 hr)
Engineering Terms (1 hr)

(Contact: Ben Lathan, Malcolm X College, 1900 W. Van Buren, Chicago, Illinois 60622, 312/962-3316 {lathan of kka})

Scales and Engineering Measurements (20 min)
Orthographic Projection: Points (15 min)

(Contact: Wayne C. Dowling, 305A Marston Hall, Iowa State University, Ames, Iowa 50011, 515/294-8365 {dowling of engr})

ENGLISH

Capitalization
- Common and Proper Nouns (30 min)
- Test in Basic Capitalization (30 min)
- Capitalization Rules for Names and Titles (15 min)
- Capitalization of Geographic Sections, Directions and Addresses (20 min)
- Capitalization of Time, Events, Organizations, and Subjects (20 min)

ENGLISH -continued-

Composition
- Assembling a Paragraph (45 min)
- Editing Symbols, Verbs (30 min)
- Topic Sentences (15 min)
- Irrelevant Details in Paragraphs (10 min)

Editing
- Improving Editing Skills (60 min)
- Editing Misspellings (60 min)
- Paragraph Editing I (1 hr)
- Paragraph Editing II (1 hr)
- Diction and Punctuation Errors (80 min)
- Basic Errors in Punctuation and Word Usage (60 min)
- Commonly Misused Words (90 min)
- Proofreading and Spelling (20 min)

Grammar
- Short Review of Parts of Speech (40 min)
- Test on Grammar and Usage (30 min)
- Complete Sentences (15 min)
- Subject and Predicate Recognition (50 min)
- Simple Subject, Verb, and Simple Complement Recognition (45 min)
- Subject-Verb Agreement I and II (1.75 hrs)
- Pronoun-Verb Agreement (10 min)
- Pronouns (30 min)
- Pronouns: Possessive, Object, Subject (45 min)
- Introduction to Verbs (30 min)
- Verb Tenses (60 min)
- Recognition of Verb Tenses (60 min)
- Subjunctive (40 min)
- Passive Verbs (30 min)
- Irregular Verbs (5 separate lessons) (3 hrs)
- Copulative Verbs (10 min)
- Verbs and Verb Phrases Within a Sentence (45 min)
- Prepositional Phrases (40 min)
- Dangling Participles, Misplaced Modifiers (60 min)
- Infinitive (35 min)
- Run-on Sentences (10 min)
- Gerunds (60 min)
- Double Negatives (15 min)
- Direct and Indirect Objects (60 min)
- Who/whom (60 min)
- Noun Clauses (60 min)
- Adjective Clauses (50 min)
- Adverbial Clauses (25 min)
- Compound Sentences (35 min)

Poetry
- Analysis of e e cummings' "portrait" (45 min)
- Inductive Approach to Poetry (20 min)
- Full, Part, and Symbolic Rhyme (60 min)

ENGLISH -continued-

Punctuation
- Punctuation Diagnostic (40 min)
- Commas and Periods (30 min)
- Semicolons and Commas (30 min)
- Basic Rules of the Semicolon (45 min)
- Use of Semicolons with Adverbs (30 min)
- Placement and Punctuation of Adverbs (20 min)
- Quotations I-VI (2.5 hrs)
- Commas with Nonrestrictives I and II (40 min)

Research
- Bibliographic Form (60 min)
- Use of the Dictionary (40 min)
- Footnotes (60 min)
- Footnotes in Term Paper--Sample (35 min)

Spelling
- Diagnostic Spelling Test (40 min)
- Singular and Plural Nouns and Possessives I and II (1 hr)
- Spelling Drill (1.5 hrs)
- Commonly Misspelled Words (2 hrs)
- "c-related" Words (25 min)
- Dictionary Symbols: Consonants (30 min)
- Dictionary Symbols: Syllable Division, Accents, Vowel Symbols (35 min)
- Plural Nouns (1 hr)

Usage
- Diagnostic Test in Usage and Sentence Structure (45 min)
- Misused Words (2 separate lessons) (90 min)
- Homonym Puzzle (20 min)
- Word Confusions I and II (25 min)

Vocabulary
- Vocabulary Building Using Latin and Greek Roots (38 lessons -- 60 min each) {scanlan of mfl}

Miscellaneous
- Analogies (1.5 hrs)
- Spelling Word Game
- Hangman Game
- Reasoning (30 min)

(General Contact: Gary Michael, Community College English, 201C Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-7450 {michael of english})

Introductory Lessons For Chaucer Students (40 min)

(Contact: N. D. Hinton, Sangamon State University, Shepherd Road, Springfield, Illinois 62708, 217/786-6720 {hinton of ssu})

ENGLISH AS A SECOND LANGUAGE

Practice in Reading and Writing (designed for foreign students) (32 hrs)

(Contact: Bill Pech, G93 Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333-1719 {pech of flb})

Syntax (10 hrs)

(Contact: Fernand Marty, G70c Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333-9776 {marty of mfl})

ENVIRONMENTAL STUDIES

Animal Ecology
Animal Management
Diet Program
Ecosystem Model
Model Development Language
Simulated Disaster
Water Pollution

(Contact: Steven Petak, 166 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801 {petak of ed})

FINANCE

Fundamentals of Real Estate and Urban Economics (6 hrs)
- Urban Growth
- Urban Structure
- Urban Problems
- Legal Environment of Urban Space Use
- Housing
- Urban Redevelopment
- Valuation and Investment Analysis
- Large-Scale Real Estate Development

(Contact: Austin Jaffe, Box 4, David Kinley Hall, Department of Finance, UIUC, Urbana, Illinois 61801, 217/333-2110 {jaffe of cerl})

Real Estate Model and Simulation (10 hrs)

Simulation of Stock Market Activity (10 hrs)

(Contact: Austin Jaffe {jaffe of cerl} or Bruce Copland, 356 Weston Hall, Champaign, Illinois 61820 217/332-2020 {copland of csa})

FOOD SERVICE TRAINING

Food Service Training Course (Maxwell Air Force Base (3 hrs)
- Food Service Preparation Forms
- Senior Cook's Requisitions
- The Cook's Worksheet
- Flight and Missile Feeding
- Techniques for Serving Lines

(Contact: Larry D. Francis, MTC Project, 361 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-7465 {larry francis of mtc})

FOREIGN LANGUAGES -- GENERAL

Polyglot Game (13 languages) (2-26 hrs)

(Contact: Fernand Marty, G70c Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333- 9776 {marty of mfl})

FRENCH

Beginning French (100 hrs)
- Dialogue
- Grammar

Culture and Civilization (6 hrs)
- Anthropology
- Geography of France
- Geology of France
- Stylistic Diversion
- Subway

Grammar and Syntax (12 hrs)

Linguistics (70 hrs)
- Phonemics
- Phonetics

Reading Comprehension/Translation (30 hrs)

Vocabulary (28 hrs)

(Contacts: Fernand Marty, G70c Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333-9776 {marty of mfl})

GENETICS

Classical
- Vocabulary Drills for Genetics (2 hrs)
- Elementary Probability and Mendel's Laws (50 min)
- Blood Typing (40 min)
- Drosophila Genetics (50 min)
- Genetics and Heredity (20 min)
- Plant Genetics Problems (20 min)
- Gene Mapping in Diploid Organisms (60-90 min)

(Contact: Kathy Herrick, 203B Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-7450 {herrick of biocc})

Chromosome Karyotyping I and II (1+ hrs)
Genetics Counseling (1+ hrs)
Reading and Writing Pedigrees (1 hr)

(Contact: Darlene Chirolas, 270 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-2375 {darlene of pso})

Quantitative Genetics (2-3 hrs)
Population Genetics (2-3 hrs)

(Contact: Michael Grossman, 215 Animal Science Laboratory, UIUC, Urbana, Illinois 61801, 217/333-2626 {grossman of 1sci})

GEOGRAPHY

Social/Cultural Geography
- Room Geography (.25 hr)
- Spatial Diffusion (1+ hrs)

(Contact: Ivan M. Pour, Department of Urban Planning, 904 W. Nevada, Urbana, Illinois 61801, 217/333-3891 {pour of urban})

Geography of France (1 hr)

(Contact: Fernand Marty, G70c Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333-9776 {marty of mf1})

GEOLOGY

Geology of France (1 hr)

(Contact: B. Mainous, G70d Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333-9776)

GEOLOGY -continued-

Introduction to Radioactivity and Geologic Time (30 min)

(Contact: D. Oberpriller, c/o Prof. John Robson, PLATO Project, Room 311, University Computer Center, University of Arizona, Tucson, Arizona 85721 {oberpriller of arizona})

New Global Tectonics and Continental Drift

(Contact: Christopher Scotese, c/o PLATO Project, 221 S.E.S., UICC, Chicago, Illinois 60640, 312/996-5157 {droege of uicc})

GERMAN

Syntax (16 hrs)
Vocabulary (44 hrs)
Reading Program for Graduate Students (26 hrs)

(Contact: Fernand Marty, G70c Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333-9776 {marty of mfl})

German Vocabulary and Reading Skills (11 hrs)

(Contact: David M. Weible, German Department, UICC, Box 4348, Chicago, Illinois 60680, 312/996-3205 {weible of german})

HEBREW (MODERN)

Elementary Modern Hebrew
First Year (60 hrs)
Second Year (first semester--20 hrs)

(Contact: Abraham Ziv, Language Laboratory, Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333-1719 {ziv of mfl})

ITALIAN

Syntax (4 hrs)
Vocabulary (35 hrs)

(Contact: Fernand Marty, G70c Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333-9776 {marty of mfl})

JOURNALISM (see also ENGLISH)

Topics in Newspaper Editing and Design
- Basic Typography (1.25 hrs)
- Headline Writing (1.25 hrs)
- Picture Editing (1.25 hrs)
- Page Layout (.3 hr)
- Spelling Test (.15 hr)

(Contact: Bill Oates, Dept. of Journalism, Indiana University, Bloomington, Indiana 47401 {oates of iu})

LATIN

Beginning Latin (40 lessons - 90 min each)
Latin Composition (31 lessons - 60 min each)
Vergil's Aeneid (8 lessons - 4 hrs each)

(Contact: Richard Scanlan, 4072 Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217-333-1008 {scanlan of mfl})

LAW

Pre-Law--Simulated Law Schools Admissions Test

Law School--Simulated First-Year Law School Experience

Lawyering
- Client Counseling
- Client Interviewing

(Contact: Charles D. Kelso, Indianapolis Law School, 735 West New York Street, Indianapolis, Indiana 46202 {kelso of lawyer})

Future Interests (2 hrs)
Offer and Acceptance (1 hr)
Patents--Non-Obviousness (1 hr)
Utility Regulation (2 hrs)
Statute of Frauds (1 hr)
Insurance Law (12 hrs)
Evidence (2 hrs)
Legal Ethics (2 hrs)
Multistate Bar Examination (7.5 hrs)
Legal Abbreviation Drill (2 hrs)
Legal Latin Drill (2 hrs)
Federal Procedure (3 hrs)

(Contact: Peter Maggs, 141 Law Building, UIUC, Urbana, Illinois 61801, 217/333-6711 {maggs of law})

LIBRARY SCIENCE

Cataloging and Classification (5 hrs)
- Bibliographic Data Identification
- File Organization--Truncated Search Keys
- Serial Cataloging
- Subject Heading Principles and Marc Tags
- Title Entries

(Contact: Kathryn Luther Henderson, 327 Library, UIUC, Urbana, Illinois 61801, 217/333-6191)

Student Guide to the Library
- The University of Arizona Main Library (10 min)
- University of Arizona Branch Libraries (20 min)
- The Card Catalog
  - Sample Card Catalog and Classification Schemes (40 min)
  - L.C. Guide to Subject Headings (20 min)
  - Types of Catalog Cards and Cross References (25 min)
  - Filing Rules: Author/Title (50 min); Subject (40 min)
  - Filing Rules: ALA Dictionary Catalog (30 min)
- A Beginning Library Research Strategy (40 min)

(Contact: Nancy Douglas, Main Library 101, University of Arizona, Tucson, Arizona 85721, 602/884-3619 {douglas of ualib})

Library Skills Test (30-40 min)

(Contact: Florence Lewis or William Bloemer, Sangamon State University, Shepherd Road, Springfield, Illinois 62708, 217/786-6600 {bloemer of ssu})

LINGUISTICS

Computational Linguistics (7 hrs)

Introduction to General Phonetics (15 hrs)
- Mid-Sagittal View of the Speech Tract
- Laryngeal Mechanisms
- Air-Stream Mechanisms
- Place of Articulation
- Classification of Speech Sounds
- Consonants
- Vowels
- Tone and Stress
- Rhythm
- Sine Wave
- Vowel Formats
- Jakobsonian Distinctive Features
- Sound Pattern of English (SPE) Features

(Contact: Chin-Chuan Cheng, 4101 Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333-1206 {cheng of mf1})

LINGUISTICS -continued-

Introductory Transformational Grammar (10 hrs)
- Introduction to Linguistics
- Phonetics and Phonology
- Morphology
- Syntax
- Relative Grammaticality and Idiolect
- Syntactic Deviancies of Deaf Students

(Contact: Stephen Quigley, Children's Research Center, UIUC, Urbana, Illinois 61801, 217/333-1850)

MACHINIST TRAINING

Machinist Training Course (29 hrs) (Aberdeen Proving Ground)
- Conversion of Metric to English
- Solution of Right Triangles
- Ordnance-Sergeant Game
- Grinding Wheels
- Identification of Tool Bits
- Milling Machines
- Indexing
- Introduction to Tapers
- Keys and Keyways
- Introduction to Threads
- Ratio and Proportion
- Thread Forms
- Lathe Speed Feeds and Depth of Cut
- Lathe Toolbits and Tool Holders
- Unified and American Threads
- MI Drills
- Reading the Micrometer
- Spur Gears
- Square and Acme Threads
- Verniers
- Shaper Toolbits and Tool Holders

(Contact: Larry D. Francis, MTC Project, 361 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-7465 {larry francis of mtc})

MATERIALS ENGINEERING

Tension Tests

(Contact: Graham Brown, Room 221, SES, UICC, Chicago, Illinois 60680, 312/996-3428)

MATHEMATICS

Elementary (60-115 hrs)
- Graphing Lessons
  - Graphs I and II
  - Signed Numbers
  - Variables
  - Functions
  - Games
- Whole Numbers Lessons
  - Addition
  - Subtraction
  - Multiplication I and II
  - Division
  - Renaming and Symbols
  - Place Value
  - Word Problems
  - Miscellaneous
- Fractions Lessons
  - Meaning of Fractions
  - Mixing Numbers
  - Equivalence
  - Addition, Like Denominators
  - Addition, Unlike Denominators
  - Meaning of Decimals
  - Multiplication of Mixed Numbers

(Contact: PLATO Elementary Mathematics Curriculum Group, 202 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-7410 {weaver or sharon of matha})

High School
- Sample Beginning Algebra Lessons (1 hr)

(Contact: Kenneth Travers, 375 Education Building, UIUC, Urbana, Illinois 61801, 217/333-3598)

Community College and Adult Education (see also MATHEMATICS: University)
- Signed Numbers (6 hrs)
- Divisors and Multiples of Numbers (2 hrs)
- Fractions (5.5 hrs)
- Decimals (5.2 hrs)
- Percent (2.7 hrs)
- Roots and Exponents (3 hrs)
- Sets (.5 hr)
- Multiplying and Factoring (3 hrs)
- Solving Linear Equations (3.5 hrs)
- Graphing Straight Lines (5.5 hrs)
- Simultaneous Equations (4.5 hrs)
- Algebraic Fractions (2.5 hrs)
- Plotting Points (2 hrs)
- Quadratic Equations (2 hrs)

MATHEMATICS -continued-

Community College and Adult Education -continued-
- Function Plotters
- Trigonometry (4 hrs)
- Slide Rule and Scientific Notation (3.5 hrs)
- Common Logarithms (1 hr)
- Probability (.5 hr)

(Contact: Lou DiBello, 203B Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-4405 {dibello of cerlcc})

University
- Linear Algebra
  - Inequalities
  - Introduction to Vectors
  - Introduction to Matrices
  - Matrix Calculator
  - Solving a System of Linear Equations
- Differential Calculus
  - Defining the Tangent to a Curve
  - How a Tangent Approximates a Curve
  - Minimum/Maximum Problems
  - Newton's Method
  - Practicing Differentiation (open-ended)
- Integral Calculus
  - Rules of Integration
  - Volumes of Solids of Revolution
  - Exercising Indefinite Integration (open-ended)
- Analytic Geometry (4+ hrs)
  - Approximations
  - General Curve Drawing
  - Plotting Problems Laboratory
  - Surface Drawing
  - Sine Curve Plotting
  - Graphics Tutorial
- Miscellaneous
  - The Function: a sin (b(x+c))
  - The Function: ln x
  - The Constant π
  - Probability and Statistics
  - Number Theory

(Contact: Samuel Wagstaff, Jr., Department of Mathematics, 221 Altgeld Hall, UIUC, Urbana, Illinois 61801, 217/333-2168 {wagstaff of uimatha})

Solving Algebraic Equations

(Contact: Peter Boysen, 227 Computer Science, Iowa State University, Ames, Iowa 50010, 515/294-8338 {boysen of amesrad})

MATHEMATICS -continued-

University -continued-

Logical Expression Minima (open-ended)

(Contact: David V. Meller, 357 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-6500 {dvm of ee})

Maxima-Minima
Trigonometry for Calculus Students

(Contact: Arunas Dagys, Mathematics Department, UICC, Chicago, Illinois 60680, 312/996-5157 {dagys of uicc})

Calculus Aids

(Contact: L. Evens, Northwestern University, 2003 Sheridan Road, Evanston, Illinois 62201, 312/492-3131 {jennifer of nuc})

Drill in Ordinary Differential Equations

(Contact: Prof. M. Mansfield, Kettler Hall, Purdue University at Fort Wayne, Fort Wayne, Indiana 46805, 219/482-5695 {stone of pfw})

Numerical Quadrature (Integration) Methods

(Contact: George Friedman, Jr., 128 Digital Comp. Lab., UIUC, Urbana, Illinois 61801, 217/333-7505 {friedman of csa})

Fourier Analysis and Synthesis (open-ended)
Matrix Inversion and Linear Equation Solution (open-ended)
(may also be -use-d in other lessons)
Introduction to Base-Ten Logarithms I and II (1 hr)
(applicable to community college level also)

(Contact: Don Shirer, 125 Neils Science Center, Valparaiso University, Valparaiso, Indiana 46383, 219/464-5370 {shirer of vu})

MEDICINE (also see other Health-related Fields in Index)

General

Medical Instructional Resources Catalog

(Contact: Dennis Olson, Rockford School of Medicine, 1601 Parkview Avenue, Rockford, Illinois 61101, 815/987-7203 {olson of ced})

MEDICINE -continued-

- Anatomy
  - General Concepts
    - Anatomical Terminology I-V: Dictionary, Drills, and Quiz on Root Words, Prefixes and Suffixes
    - Planes, Directions, and Movements
  - The Upper Limb
    - Upper Member Clinical Application
    - Upper Member Anatomy Quiz
  - The Head and Neck
    - ATS Tutorial on the External Muscles of the Eye
  - The Chest
    - Anatomy Quiz: Coronary Heart Disease
- Biochemistry (see Index)
- Clinical Science
  - Clinical Programs
    - Emergency Room
    - Doctor's Office
    - Clinical Self-Assessment Questions
      - Liver I, Heart I, Kidney I (84 questions)
      - Biochemistry I, Nerve-Muscle I, Tissue-Skin I, Nutrition I (85 questions)
      - Microorganisms I, Central Nervous System I, Gastrointestinal I (91 questions)
      - Behavioral Science I, Blood I, Nutrition II, Pulmonary I (90 questions)
      - Renal I, Cardiovascular I, Liver II, Behavioral Science II (88 questions)
      - Liver III, Renal II, Pulmonary II, Central Nervous System III (85 questions)
      - Biochemistry II, Behavioral Science III, Nerve-Muscle II, Tissue-Skin II (93 questions)
  - Other Clinical Exercises
    - Drug Identification Game
    - Venereal Disease--Diagnosis, Manifestations, and Microbiological Characteristics
    - Exercises in Differential Diagnosis
  - Health Hazard Appraisal
- Genetics (see Index)
- Microbiology (see Index)
- Pharmacology (see Index)
- Physiology (see Index)

(Contact: Dr. Allen Levy, School of Basic Medical Sciences, UIUC, Urbana, Illinois 61801, 217/333-2507 {levy of mc1})

- Biostatistics
  - Error Types and Hypothesis Testing--An Approach to Decision Making

(Contact: Robert Votaw, Building A, Room M033, Health Center, University of Connecticut, Farmington, Connecticut 06032, 203/674-2137 {votaw or kavanagh of conn})

MICROBIOLOGY

Cell Growth
Phases of Cell Growth (3 hrs)

(Contact: Rosanne Francis, 110 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-6210 {r francis of microbio})

Bacteriology
- Microbial Toxins
  - Algal and Fungal Species
  - Bacterial Toxins
  - Clinical Cases
- Micrologue I and II: Gram Positive Cocci

Parasitology
- General Parasitology Terminology
- Parasitic Protozoan Terminology
- Parasitic Metazoan Terminology
- Medical Parasitology
  - Commensal Amoebae
  - Pathogenic Amoebae
  - A Typical Sporozoan Life Cycle
  - Parasitic Sporozoans I and II
  - Tissue and Lumen-Dwelling Ciliates
  - Tissue and Lumen-Dwelling Flagellates
  - African Trypanosomiasis
  - American Trypanosomiasis
  - Leishmaniasis

Virology
- Structural Characteristics of the Virion
- Viral Multiplication (Adsorption through Eclipse)
- Viral Multiplication (Replication through Release)
- Viral Diagnostic Techniques
- Major Viral Groups
  - Small-Size DNA Viruses
  - Medium-Size DNA Viruses
  - Large-Size DNA Viruses
  - DNA Virus Review Quiz

Microquizzes
- Respiratory Infections
- Gastrointestinal Infections

(Contact: Dr. Allen Levy, School of Basic Medical Sciences, UIUC, Urbana, Illinois 61801, 217/333-2507 {levy of mcl})

MICROBIOLOGY -continued-

Serial Dilution Problems (1 hr)

(Contact: Gary Hyatt, P.O Box 4348, Department of Biological Sciences, UICC, Chicago, Illinois 60680, 312/996-2797 {hyatt of uiccbio})

MUSIC

Elementary Music (1.5 hrs)
- Complete the Measure
- Keyboard Drill
- Notes and Rests
- Rhythm Exercises
- Time Signatures

Instrumental Methods (19 hrs)
- Bassoon, Clarinet, Euphonium, Flute, Horn, Oboe, Percussion, Saxophone, Trombone, Trumpet, Tuba

Jazz Chording (2 hrs)
Kodaly Handsignals and Solmization (1 hr)
Micro-Teaching (.5 hr)
Music Box Demonstration

Music Games (.5 hr each)
- Five X Seven
- Keyspinner
- Music Canon
- Musical Squares

Percussion Terminology (5 hrs)
Scale Structures (1 hr)
Tests and Measurements (5 hrs)
Theory-Figured Bass Realization (.75 hr)
Transposition and Score Reading (1 hr)
Violin Fingering Drill (.5 hr)

(Contact: David Peters, 3004 Music Building, UIUC, Urbana, Illinois 61801, 217/333-3064 {peters of music})

Introduction to Pitch Sets (M12 Notation)
Music-Staff Display Generating Routine

(Contact: Gary Wittlich or Nathan Syfrig, Indiana University, Bloomington, Indiana 47401, 812/337-1757 {wittlich of iu})

NURSING

Maternal-Child Nursing
- Introduction to MCH Nursing
- Anatomy: Review of Female
- Obstetrical Anatomy I and II
- Vocabulary Quizzes for Obstetrical Anatomy
- Mechanism of Labor in a Normal Delivery
- Vocabulary Quiz for Mechanism of Labor
- Fetal Circulation
- Vocabulary Quiz on Fetal Circulation
- Placental Transfer
- Vocabulary Quiz on Physiology
- Physiology of Reproduction

Pharmacology
- Major Drug Categories

(Contact: Maryann Bitzer, 306 E. Colorado, Urbana, Illinois 61801, 217/328-2094 {mdb of cerl})

- Body Temperature Balance
- Introduction to Shock

(Contact: Chris Church, Indiana University School of Nursing, 1407 E. Tenth St., Bloomington, Indiana 47401, 317/337-7089 {church of iu})

- Pediatric Pharmacology for Nurses
- Lactation: A Review
- Graphic Analysis of Labor
- Simulated Clinical Encounters in Nurse-Midwifery
- Postoperative Nursing Care
- Patient Care Problems
- Pediatric Medication Administration
- Rehabilitation Nursing
- Anxiety
- Neurosis and the Treatment of Neurosis
- Review of Anxiety and Neurosis
- Affective Illnesses, Their Causes and Treatment
- Concept of Dependence
- Simulated Patient Care Problems
  - Anxious Patient
  - Depressed Patient #1
  - Depressed Patient #2

(Contact: Richard Trynda, Room 824, College of Nursing, UI Medical Center, 845 S. Damen, Chicago, Illinois 60680, 312/996-7937 {trynda of nursing})

- Welcome to PLATO
- Reproductive Anatomy Review (.5 hr)
- Influence of Hormones on Reproduction (.5 hr)
- Postpartum Involution (.75 hr)
- Medications for Use in Obstetrics (1-1.5 hrs)
- Introduction to the Labor Process (1.5-2 hrs)

NURSING -continued-

Fetal Circulation Game (1.5-2 hrs)
Infant Pulmonary Circulation (.5 hr)
Labor Case Study of a Multigravida (.5 hr)
Fetal Heart Rate Monitoring (.75 hr)
Complicated Labor (3 studies) (1.5 hrs)
Labor Case Study--Primagravida
Math Review for Nurses

(Contact: Pat Tymchyshyn, Parkland College, 2400 West Bradley, Champaign, Illinois 61820, 217/351-2292 {tym of park})

NUTRITION

Basic Principles of Nutrition (4 hrs)
- Overview
- Digestive Organs and Functions
- Carbohydrates
- Lipids
- Proteins
- Energy
- Four Food Groups

(Contact: Frances LaFont, 351 Bevier Hall, UIUC, Urbana, Illinois 61801, 217/333-3936 {lafont of nutr})

PHARMACOLOGY, PHARMACY AND PHARMACAL SCIENCES

Factors Affecting Drug Solubility
Effect of pH on Partition Coefficient
Review of Graphical Methods
Kinetics of Aspirin Analysis
Interpreting Blood-Level Curves I
Quantitative Structure-Activity Relations
Organic Acid-Base Theory
Nomenclature of Aldehydes and Ketones
Carboxylic Acids Nomenclature I and II
Nomenclature of Amines
Clinical Methods of Analysis
Enzymatic Methods of Analysis
Pharmacy Calculation Exercises
Biochemistry of Scar Formation
Physiological Parameters Review
Medical Abbreviations Review
Medical Terminology Review
Parameters Following Review Game
Parameters Following Simulation
Amino Acid Metabolism Case Studies
Pharmacy Typing Exercises
Biochemistry of Obesity
Biochemistry of Scar Formation

PHARMACOLOGY, PHARMACY AND PHARMACAL SCIENCES -continued-

Biochemistry of Vitamin C Deficiency
Pharmacy Percentage Calculations

(Contact: H. J. R. Weintraub, Purdue University School of Pharmacy and Pharmacal Sciences, West Lafayette, Indiana 47907, 317/749-2204 {weintraub of phar})

Introduction
- Pharmacokinetics I: Drug Administration, Absorption, and Distribution
- Pharmacokinetics II: Drug Action, Metabolism, and Excretion
- Introduction to General Pharmacology I: Absorption and Distribution
- Introduction to General Pharmacology II: Metabolism and Excretion
- Introductory Pharmacology: Fetal Pharmacology
- Pharmacokinetics I: Introduction to Absorption, Distribution, Metabolism and Excretion
- Pharmacokinetics II
- Introductory Pharmacology: Review

Autonomic Nervous System
- Neurohumor Metabolism: Metabolic Pathways of Primary Neuromediators
- Pharmacology of Adrenergic Agents
- A Laboratory Experience in Pharmacology of the Autonomic Nervous System

Autonomic Pharmacology
- General Introduction and Review
- Synthesis and Biotransformation of Neurotransmitters
- Cholinergic Mechanisms and Uses
- Review
- Adrenergic Mechanisms and Uses
- Arterial Blood Pressure in the Dog

Central Nervous System
- Sedatives and Hypnotics
- The Pharmacology of Ethanol
- Anticonvulsant Quiz
- General Anesthesia
- Anesthesia Case Study
- Anesthesia Quiz
- Antidepressant Quiz
- Stimulants and Hallucinogens
- Aspirin-type Analgesics and Anti-Inflammatory Agents
- Analgesia Review
- Review Quiz

Endocrine Drugs
- Adrenal Steroids
- Oral Contraceptives
- Insulin and Oral Hypoglycemic Agents
- Thyroid Agents

PHARMACOLOGY, PHARMACY AND PHARMACAL SCIENCES -continued-

Cardiovascular
- Case History: Management of Hypertension
- The Treatment of Cardiac Arrhythmias
- Drugs: Hematinic Agents

Chemotherapeutics
- Case Series: Antibiotics
- Antibiotics Consult I-V
- Review Questions

Vitamins
- Drugs: Introduction to Vitamins

Toxicology
- Case History: Emergency Admission from Unexpected Drug Reaction
- General Review
- Case Study I and II
- Review Quiz

Quizzes and Miscellaneous
- Structure Quiz: Structure Identification of Selected Pharmaceutical Agents
- Drugs
  - Anti-Inflammatory Quiz
  - Anti-Inflammatory Agents--Consult
  - Local Anesthetic Agents
  - Local Anesthetic Review
  - Diuretics Quizzes, I and II

(Contact: Dr. Allen Levy, School of Basic Medical Sciences, UIUC, Urbana, Illinois 61801, 217/333-2507 {levy of mc1})

PHOTOGRAPHY

Basic Camera Operation
- F/stops and Shutter Speeds
- Choosing Camera Settings

(Contact: Janet Clegg Thiher, 2335 Woodbridge St. #239, St. Paul, Minnesota 55113)

Basic Camera Operation (1 hr)

(Contact: James Evans, 58 Mumford Hall, UIUC, Urbana, Illinois 61801, 217/333-4785)

PHYSICAL EDUCATION

The Eshkol-Wachmann Movement Notation System (3-4 hrs)

(Contact: Prof. Annelis Hoyman, 212 Freer Gymnasium, UIUC, Urbana, Illinois 61801, 217/333-0016 {hoyman of pea})

Projectile Motion in Biomechanics (1 hr)
Biomechanics of Running (1-2 hrs)
Visual Perception--Testing Figure-Ground Perception (.5 hr)
Attitudes Towards High School Physical Education (.5 hr)
Badminton Singles Strategy (.5 hr)
Introduction to Cross Country Running (1 hr)

(Contact: M. Reece, 201 Kenney Gymnasium, UIUC, Urbana, Illinois 61801, 217/333-2484 {reece of pea})

A Computer Simulation of the Planar Motion of the Human Body under Free-Fall Conditions
Stride Length vs. Stride Frequency

(Contact: Peter Boysen, 227 Computer Science, Iowa State University, Ames, Iowa 50010, 515/294-8338 {boysen of amesrad})

PHYSICS

General 'Service' Lessons (open-ended)
- Calculator, Function Plotter, Root Finder, f(x)=0
- Plotters: Polar, Intensity, Parametric
- GRAFIT--Programmable Plotter {b sherwood of phys}
- Mini-Calculator
- Numerical Integration and Least Squares
- Matrix Routines: Simultaneous Linear Equations, Eigenvalues and Negative Vectors
- Matrix Inversion (open-ended) {shirer of vu}
- 3-D Plotter, Projections
- Fourier Analysis and Synthesis {shirer of vu}

(Contact: Carol D. Bennett, 267 Physics Building, UIUC, Urbana, Illinois 61801, 217/333-7589 {bennett of phys})

Intermediate Light (2 hrs)
- Ray Tracing Through a Single Spherical Refracting Surface
- Optical Path Length as a Function of Displacement
- Fermat's Principle

(Contact: David C. Sutton, 329 Physics Building, UIUC, Urbana, Illinois 61801, 217/333-4359 {sutton of phys})

PHYSICS -continued-

Classical Mechanics (60 hrs)
- Service Lessons
  - Introduction to PLATO
  - Comments on PLATO Physics Lessons
  - Physics PLATO Classroom Schedule
  - Calculator and Function Plotter
  - GRAFIT Programming Facility
- General Mechanics Lessons
  - A Review of Classical Mechanics (50 min)
  - 20 Multiple-Choice Mechanics Questions (25 min)
  - Interterminal Problem Solving Contest
  - Interterminal Game on Physics Formulas
  - Games Involving Classical Mechanics
  - Relative Motion: Boat on a River (15 min)
- Vectors
  - Introduction to Vectors (50 min)
  - Drill on Vector Addition and Subtraction (45 min)
  - Homework: Vectors
  - Introduction to Relative Motion (15 min)
- Kinematics
  - One-Dimensional Kinematics I and II (130 min)
  - Homework: One-Dimensional Kinematics
  - Two-Dimensional Kinematics (170 min)
  - Homework: Two-Dimensional Kinematics
  - I Shot an Arrow into the Air...
  - Graphical Kinematics I and II (180 min)
- Dynamics
  - Forces and Free-Body Diagrams (70 min)
  - Free-Body Diagrams Without Rotation (80 min)
  - Homework: Force and Simple Dynamics
  - Homework: Dynamics
  - Game Balancing Three Forces (15 min)
- Work and Kinetic Energy
  - Work and Kinetic Energy (70 min)
  - Homework: Work and Kinetic Energy
  - Work Done by Position-Dependent Forces (20 min)
  - The Work-Energy Equation (70 min)
  - Homework: Conservation of Energy
  - Workout Games
- Momentum
  - Conservation of Momentum (45 min)
  - Homework: Momentum and Collisions
  - Drill on Momentum in Collisions (7 min)
  - Center-of-Mass Drill (5 min)
- Rotational Dynamics
  - Moment of Inertia and Rotational Kinetic Energy (20 min)
  - Torque and Angular Momentum (60 min)
  - Homework: Rotational Dynamics
  - Free-Body Diagrams (with Rotation) (70 min)
  - Homework: Rotation Problems
  - Homework: Torque and Angular Momentum
  - Torque Game

PHYSICS -continued-

Classical Mechanics -continued-
- Simple Harmonic Motion
  - Oscillations: Simple Harmonic Motion (110 min)
  - Homework: Simple Harmonic Motion
- Gravitation
  - Homework: Gravitation
- Laboratory
  - Combining Experimental Errors (20 min)

(Contact: Bruce Sherwood, 272 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-6210 {b sherwood of phys})

Electricity and Magnetism
- Elementary
  - Charge Game with Introduction to Electric Fields
  - Circuits
  - Faraday's Law
- Advanced
  - Laplace's Equation--Relaxation
  - Laboratory Experiment Aids {gorey of o}

Waves, Optics, and Modern Physics (25+ hrs)
- Wave Phenomena
  - Traveling Waves and the Wave Equation
  - Vibrating String Experiment
  - Shock Waves from an Airplane
  - Addition of Waves: $\cos(k_1 x)+\cos(k_2 x)$, etc.
  - Resonances in Pipes plus an Experiment
- E-M Radiation and Physical Optics
  - Polarizers
  - Doppler Effect
  - Slit Interference and Diffraction
  - Phase (Vector) Diagrams plus a Quiz
  - Spectroscope Apparatus Experiment
- Geometric Optics
  - Snell's Law: Includes 2 Games
  - Thin Lenses: Ray Tracing Exercises
  - Plane Mirrors: Graphical Exercises
  - Spherical Mirrors: Numerical Exercises
  - Sign Conventions in Optics: Mirrors, Lenses, Surfaces
  - Homework Problems
  - Refracting Plane Surface: Ray Diagrams
- Particles and Waves
  - Photoelectric Effect
  - Compton Effect

PHYSICS -continued-

Waves, Optics, and Modern Physics (25+ hrs) -continued-
- Quantum Mechanics--Elementary
  - Plots of Wave Packets
  - Heisenberg Uncertainty Principle
  - Infinite Square-Well Potentials
  - Finite Potential Wells and Barriers
  - Exercises with Potential-Well Wave Functions
  - Quantum Mechanics Review Problems
  - Nuclear Decay Processes, Half-Life
  - Vibrations/Rotations in Diatomic Molecules
  - Nuclear Reactions: alpha, beta decays
- Quantum Mechanics--Intermediate
  - Wavefunctions for 1-D Potentials
  - Wavefunctions for Radially Symmetric Potentials
  - Addition of Angular Momentum
  - Matrix Algebra
  - Helium Atom I and II
- Review Questions
  - Multiple Choice Questions from 1972-1973 Hourly Exams
  - Quantum Mechanics Problems from 1973-1974 Hourly Exams

(Contact: Carol D. Bennett, 267 Physics Building, UIUC, Urbana, Illinois 61801, 217/333-7589 {bennett of phys})

Acoustics
- Vibrating Systems (60 min)
- Musical Acoustics
- Decibels I and II (1 hr)

Elementary Nuclear Physics
- Subnuclear Particles, Conservation Laws, Reactions (1.5 hrs)

Elementary Thermodynamics
- Thermal Equilibrium (30 min plus open-ended lab)

Special Theory of Relativity
- Introduction (20 min)
- High Speed Physics (50 min)
- Mass and Energy (50 min)

(Contact: Don Shirer, 125 Neils Science Center, Valparaiso University, Valparaiso, Indiana 46383, 219/464-5370 {shirer of vu})

PHYSICS -continued-

Quantum Mechanics--Intermediate and Advanced (10+ hrs)
- Guided Exercises
  - Addition of Angular Momentum
  - Matrix Algebra
- Guided Self-Consistent Calculation (2-5 hrs)
  - Helium Atom--Electron Potential and Wave Function
- Wave Functions (open-ended)
  - Finite Well and Barrier Potentials
  - Arbitrary Potentials, V(x)
  - Radial Potentials, V(r), and Phase Shifts

(Contact: Carol D. Bennett, 267 Physics Building, UIUC, Urbana, Illinois 61801, 217/333-7589 {bennett of phys})

PHYSIOLOGY (see also BIOPHYSICS, MEDICINE, PHARMACOLOGY)

Simulation of Human Cardiovascular System

(Contact: Erik Jakobsson, Department of Physiology, UIUC, Urbana, Illinois 61801, 217/333-3918 {mckown of physio})

Regulation of Body Fluids
- Introduction to Renal Function

Cardiovascular
- The Cardiac Cycle
  - Direction of Flow and Basic Cardiac Anatomy
  - Physical Parameters of the Cardiac Cycle
- Introduction to the Electrical Activity of Myocardial Tissue

Nervous System
- Action Potentials of Single Nerve Fibers
- Neurophysiology Review

(Contact: Dr. Allen Levy, School of Basic Medical Sciences, UIUC, Urbana, Illinois 61801, 217/333-2507 {levy of mcl})

Drill on Cat Muscles (30-40 min)

(Contact: Charles Guerra, College of Pharmacy, UIMC, Chicago, Illinois 60612, 312/996-7190 {guerra of uimc})

PILOT TRAINING

Primary Training
Private Pilot Test
Pre-flight Planning
Test on VOR Usage

Advanced Training
Holding Pattern Training

(Contact: Stanley Trollip, Aviation Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-3162 {trollip of arlc})

Aviation Index of Lessons
Sequence Reports (Weather) (30-40 min)

(Contact: David Lombardo, P.O. Box 2456, Station A, Champaign, Illinois 61820, 217/356-4939 {lombardo of ed})

POLITICAL SCIENCE

Congressional Candidates (.5 hr)
Congressional Committee Chairman and the Legislative Process (.5 hr)
Teacher Union Bargaining (.5 hr)
Issues, Public Opinion, and Candidate Strategy (.5 hr)

(Contact: Don Emerick, 359 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-6500 {don emerick of icbd})

The Ideological Spectrum (1.5 hrs)
Logic: Fallacies (1 hr)
Logic: Propaganda Methods (.8 hr)

(Contact: Errol Magidson, Kennedy-King College, 6800 S. Wentworth, Chicago, Illinois 60621, 312/962-3446 {errol of kka})

Multiple Choice Test on the U.S. Constitution (jr. high - college)
Multiple Choice Test on the Illinois Constitution (jr. high - college)

(Contact: Wm. Bloemer or Norman D. Hinton, Sangamon State University, Shepherd Road, Springfield, Illinois 62708, 217/786-6600 {hinton or bloemer of ssu})

POPULATION DYNAMICS

Population Programs
- Population Projection by Country (1-3 hrs)
- Historical Growth of Population (1 hr)
- Regional Population Projection (1-2 hrs)
- Two Sex Population Projection (1-2 hrs)
- Migration and Urbanization (1 hr)
- Contraceptive Coverage Model (1 hr)
- General Purpose Model (1 hr)
- Life Table Model (2 hrs)
- How to Project a Population (1 hr)
- Population Dynamics Seminar (1-2 hrs)

Energy Programs
- Labor Force Analysis (1 hr)
- Economic Development (1 hr)
- Educational Costs and Enrollment (2 hrs)
- Energy Demand Model (.5 hr)
- Cereals Demand and Supply Projection (1 hr)
- Food Supply Model (1 hr)
- World Petroleum Trade (1 hr)
- Energy Demand and Supply in the U.S.A. (1 hr)
- Nation's Current Energy Conditions (2 hrs)

(Contact: C. Roh or P. Handler, 66 Coordinated Science Laboratory, UIUC, Urbana, Illinois 61801, 217/333-3827 {roh of pdg})

PSYCHOLOGY

Descriptive Statistics (14 hrs)
- Moments, Transformations, Z-Scores, Normal Curves
- Permutations and Combinations
- Random Sampling and Probability
- Binomial Distribution
- Sampling Distributions with Demonstration of Central Limit Theorem
- Hypothesis Testing and Power
- Analysis of Variance
- Correlation and Regression
- Chi-Square
- Matrix Algebra

General Psychology
- Motivational Control System (1 hr)
- Neural Network Demonstration (2 hrs)
- Psychology Experiments--Short Term Memory Experiment (1 hr)
- Reliability and Validity
- Multitrait-Multimethod Procedure

PSYCHOLOGY -continued-

Social Psychology (6 hrs)
- Theory: Defined and Evaluated
- Attitude Theory and Measurement
- Dissonance vs Self-Perception Theory
- Asch Conformity Study
- Personal Space Demonstration
- Diffusion of Innovations
- Subject Roles Demonstration
- Social Choice Research Demonstration
- Prisoner's Dilemma Explanation & Interactive Demonstration
- Game Theory and the Prisoner's Dilemma Game
- The N-Person Prisoner's Dilemma Game
- Deutsch and Krass Tracking Game

(Contact: Jerry L. Cohen, 219D Psychology Building, UIUC, Urbana, Illinois 61801, 217/333-2578 {cohen of psych})

Operant Learning (open-ended, 5-6 hrs)

(Contact: R. A. Avner, 350 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-6500x20 {avner of s})

READING

[Instructional materials are in conceptual areas which are modular in structure, each activity designed to require no more than 15 minutes (average student completion time about 8 minutes). Most modules are 'free-standing.'] (30 hrs)

- Start the Day Activities
- Orientation Activities
- Practice with "Next" and "Yes and No"
- Practice with the "Help" Key
- Practice Typing Your Name
- Letter Name Super-Test
- Visual Discrimination
  - Letters
  - Letters, Rotations and Reversals
  - Simple Word Forms
- Word Detail
  - No Relationships and Complete Reversals
  - Add and Omit Letters
  - Final and Medial Substitutions
  - Final and Medial Reversals
- Letter Names (A-Z)
- Review Activities for Letter Names
- Letter-to-Sound Correspondences

READING -continued-

Favorite Stories for Children
Paced Stories for Comprehension
Sight Words
(the,boy,is,happy,one,girl,was,sad,you,and,I,run,we,are,not,open,
they,will,be,closed,did,she,run,fast)
Auditory Discrimination

(Contact: Priscilla Obertino, 200E Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-7409 {cill o of reading})

RUSSIAN

Cyrillic Alphabet
Alphabet Order (4 hrs)
Russian Reading Lessons (89 hrs) (2 semesters)
(based on Dewey-Mersereau, Reading and Translating Contemporary Russian)
Laboratory Drills for Russian 101, 102 (47 hrs) (2 semesters)

(Contact: Constance Curtin, 355 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-6500x45 or 217/333-8203 {curtin of mfl})

Translations of Some PLATO Lessons (used for demonstration in Russia in 1973)
Russian Typing Lesson (2 hrs) {a appel of mcl}

(Contact: Peter Maggs, 141 Law Building, UIUC, Urbana, Illinois 61801, 217/333-6711 {maggs of law})

Syntax (8 hrs)
Vocabulary for Tourists (8 hrs)

(Contact: Fernand Marty, G70c Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333-9776 {marty of mfl})

SOCIAL WELFARE

Poverty Lines
English Poor Laws (to 1601)
Charity Organization Society and Neighborhood Movements
Overview of the Social Welfare System
Determining Eligibility in Public Assistance
Negative Income Tax

(Contact: Marilyn Flynn, 1207 W. Oregon, UIUC, Urbana, Illinois 61801, 217/333-1638)

SOCIOLOGY

Sociological Statistics--Laboratory Exercises (5+ hrs)

(Contact: Phyllis Ewer, Sociology Department, UICC, Chicago, Illinois 60680, 312/996-3009 {ewer of uicc})

SPANISH

Vocabulary
- Spanish Vocabulary via Cognates
- Multilingual Drill

Introduction to Spanish via the "GLOPAR" Method (15-18 hrs)
Verb Conjugation Drills (4 hrs)
Beginning Spanish
Cultural History of Spain for Beginners

(Contact: Armando Armengol, 4080 Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333-3390)

Syntax (14 hrs)

(Contact: Fernand Marty, G70c Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333-9776 {marty of mfl})

SPEECH and HEARING SCIENCE

Phonetics and Phonology
- Simple Reading Drill (20 min)
- Consonant Transcription (20 min)
- Vowel and Diphthong Transcription (25 min)
- Syllable Transcription (40 min)
- Simulation of Speech Sound Production (open-ended)
- Organogenetic Feature Drill (open-ended)
- Distinctive Feature Reasoning (open-ended)
- Phonetic Crossword Puzzles
- Hangman in Phonetics

Finger Spelling
Simulation of Audiological Testing
Anatomical Terminology

(Contact: Elaine Paden, 335 Illini Hall, UIUC, Urbana, Illinois 61801, 217/333-3050 {j wilson of unidel})

STATISTICS (see also PSYCHOLOGY)

Statistical Laboratory (open-ended, 5 hrs typical use)
Statistical Service Package (open-ended, 8 hrs typical use)

(Contact: R. A. Avner, 350 ERL, UIUC, Urbana, Illinois 61801, 217/333-6500 {avner of s})

Matrix Algebra for Multivariate Statistics
Diagnostic Test (60 min)
Definitions and Simple Operations (20 min)
Matrix Multiplication (40 min)
Matrix Inversion: Determinant, Adjoint, Cofactor and Inversion (60 min)
Transformation: Axis Rotation, Orthogonal Transformation, SSCP Matrix and Covariance Matrix (60 min)
Eigenvalues and Eigenvectors (60 min)
Statistical Package (open-ended)

(Contact: Kumi Tatsuoka, 350 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-6500 {kumi of peer})

Factor Analysis (2 hrs)

(Contact: Larry Francis, MTC Project, 361 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-7465 {larry francis of mtc})

SWEDISH

Syntax (in preparation)
Translations of a PLATO Mathematics and a Biology Lesson

(Contact: Fernand Marty, G70c Foreign Languages Building, UIUC, Urbana, Illinois 61801, 217/333-9776 {marty of mfl})

URBAN STUDIES

Social Policy Impact Model (2 hrs)
Education Budget Allocation

(Contact: Carl Patton, Urban and Regional Planning, 909 W. Nevada, UIUC, Urbana, Illinois 61801, 217/333-3020 {patton of cerl})

VEHICULAR TRAINING

Vehicular Training Course (60 hrs) (Chanute Air Force Base)

- Basic Electricity
- Electrical Current, Voltage, Resistance
- Series and Parallel Circuits
- Electrical Schematics
- Electromagnet--Magnetism
- Battery Ignition Systems
- Battery Hydrometer Drill
- Auto Lighting and Warning Systems
- Electronic Ignition/Components and Operation
- Ignition Game
- DC Generators
- DC Regulators
- Automotive Oscilloscope
- Introduction to Engine Fundamentals
- Principles of Gas Engines
- Engine Classification
- Evaporative Emissions
- Cooling Systems
- Crank-Motor Diagnosis
- Cranking Motors
- Crankcase Ventilation
- Fuel Pump Volume and Pressure Tests
- Automatic Transmissions/Torque Converters/Fluid Coupling
- Valve Train Assembly
- Carburetor Drill
- Power Steering
- Clutches
- Differentials
- Wheel Alignment
- Suspension Systems
- Propeller Shafts, Uni-Joints
- Lubrication/Oil System Components and Oil Flow
- Air and Exhaust Systems
- Basic Hydraulics
- Hydraulic Schematics
- Brake Systems
- Hydraulic Brake System
- Air Brake Systems
- Diesel Engines
- Transfercase and Power Take Offs
- Measurements
- Soldering

(Contact: Larry D. Francis, MTC Project, 361 Engineering Research Laboratory, UIUC, Urbana, Illinois 61801, 217/333-7465 {larry francis of mtc})

VETERINARY MEDICINE

Anatomy
- Veterinary Terminology Program (6 hrs)
- Anatomical Terminology (Directions, Locations and Motions) (2 hrs)
- Veterinary Cytology (5 hrs)
- Principles of Circulation (3 hrs)
- Histology of the Skin (4 hrs)
- Histology Superquiz (6 hrs)
- Self-Assessment Program in Histology (4 hrs)
- Neuroanatomy of Spinal Reflex Loops (3 hrs)
- Innervations of the Thoracic and Pelvic Limbs (10 hrs)
- Nervewar (10 hrs)
- Termwar (10 hrs)
- Eye Anatomy Quiz (3 hrs)

Applied Anatomy
- The Pupillary Light Reflex (2 hrs)

Clinical and Laboratory Practice
- Heart Valve Locations (1 hr)
- Identification of Normal and Abnormal Heart Sounds (4 hrs)
- Canine Cardiac Conditions (5 hrs)
- EKG Interpretation (6 hrs)
- Canine Eye Diseases (16 hrs)
- Canine Neurological Diagnosis (15 hrs)

Clinical Pathology
- Clinical Pathology Exercises on Anemia (2 hrs)
- Cases in Clinical Pathology (9 hrs)
- White Blood Cell Counts and Differentials: An Exercise in Interpretation (4 hrs)
- Clinical Renal Pathology (1 hr)
- Fundamentals of Leukocyte Functions (1 hr)

Diseases of Poultry
- Poultry Diseases (15 hrs)
- Slide Review--Poultry Diseases (2 hrs)

Food Hygiene and Public Health
- Exotic Diseases (5 hrs)
- Antemortem Inspection Procedures and Humane Slaughter (3 hrs)
- Postmortem Inspection Procedures (5 hrs)
- Simulated Antemortem and Postmortem Inspections (6 hrs)
- Veterinary Public Health Aspects of Milk and Dairy Products (3 hrs)
- Pasteurization of Milk and Dairy Products (2 hrs)
- Foodborne Disease Investigation (2 hrs)
- Transmission of Zoonoses (2 hrs)
- Computer-managed Instruction in Veterinary Public Health (6 hrs)

VETERINARY MEDICINE -continued-

Medicine (Veterinary Diagnostic Cases)
- Veterinary Diagnosis Program (39+ cases, 15-45 min each)
- Bovine Diagnostic Cases (6 hrs)
- Canine Diagnostic Cases (10 hrs)
- Equine Diagnostic Cases (6 hrs)
- Porcine Diagnostic Cases (3 hrs)
- Feline Diagnostic Cases (1 hr)
- Laboratory Animal Diagnostic Cases (1 hr)

Microbiology
- Laboratory Characteristics of Individual Bacteria (24 hrs)
- Identification of Bacteriological Unknowns (12 hrs)
- Veterinary Mycology Program (10 hrs)
- Identification of Viral Unknowns (11 hrs)
- Self-Assessment Program--Microbiology (5 hrs)
- Fundamental Bacteriology (5 hrs)

Nutrition
- Nutrition Problems (10 hrs)
- The Pearson Square (5 hrs)

Parasitology
- Identification of Arthropods Important in Veterinary Medicine (7 hrs)
- Quiz on Internal Parasites of Domestic Animals (2 hrs)
- Protozoa of Veterinary Importance (4 hrs)
- Life Cycles of Protozoa (2 hrs)
- Student Self-Assessment Program in Parasitology (1 hr)

Pathology
- Common Canine Tumors (4 hrs)
- Student Self-Assessment Program in Pathology (3 hrs)

Pharmacology
- Quiz on Drugs Used in Veterinary Medicine (6 hrs)
- Formulation of Drug Dosage Regimens (A Simulation) (4 hrs)

Physiology
- The Bioelectric Properties of Cell Membranes (2 hrs)
- Electrocardiography (1 hr)
- Hormonal Control of Carbohydrate and Lipid Metabolism (2 hrs)
- Essentials of Endocrinology (5 hrs)
- Review of Endocrinology (4 hrs)
- Identification of Hormone Unknowns (10 hrs)
- Fundamentals of Urine Formation (2 hrs)
- The Cardiac Cycle (2 hrs)
- Pulmonary Volumes and Capacities (3 hrs)
- Student Self-Assessment Program in Physiology (2 hrs)

VETERINARY MEDICINE -continued-

Radiology and Nuclear Medicine
- Formulation of a Radiographic Technique Chart (3 hrs)
- Fundamentals of Radiology (6 hrs)
- Diagnosis of Canine Hip Displasia (2 hrs)
- Diagnostic Radiology (5 hrs)
- Gamma Ray Spectrometer (1 hr)
- Basics of Radioisotope Counting (2 hrs)

Surgery
- Operation of Anesthetic Equipment (10 hrs)
- Surgical and Clinical Instruments (10 hrs)
- Acid Base Balance in Anesthesiology (1 hr)

Theriogenology
- Student Self-Assessment Program in Theriogenology (3 hrs)
- Anatomy and Physiology of Reproduction (3 hrs)
- Gestation and Parturition (4 hrs)
- Complications of Parturition (4 hrs)
- Pregnancy Diagnosis and Infertility (4 hrs)

Veterinary Economics and Business Management
- Financial Analysis of a Veterinary Practice (Case Studies) (9 hrs)

Miscellaneous
- CVM Medical Library (1 hr)
- Veterinary Cartoons
- Vetmed Calculator (3 hrs)
- See and Make Comments About CVM PLATO (2 hrs)

(Contact: John Silver, 161 Vet Med, UIUC, Urbana, Illinois 61801, 217/333-7467 {silver of vm})